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(54) RECORDING DEVICE AND DATA MANAGING METHOD

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a recording device for reducing the seek of a head and the number of times of search.

SOLUTION: This recoding medium is provided with a buffer 33 for temporarily storing video/voice data, a recording medium 20 for recording a video/voice

block when the size of a video/voice block constituted of the video/voice data exceeds a prescribed value, and a file managing means for managing a file by using data indicating the leading recording position of the video/voice, block, data indicating the size of the video/voice block, and data indicating inter-video/ voice block link.

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CLAIMS

[Claim(s)]

[Claim 1] In the data control approach of managing the image voice data which consists of both an image, voice, or an image and voice to the record medium which has an image voice data field and a management data field An

image voice block is constituted from said image voice data which stored said image voice data temporarily at the buffer, and was stored temporarily at said buffer. When the magnitude of said image voice block exceeds a predetermined value, while recording said image voice block on said image voice data field 1 belonging to an image voice file, or said two or more image voice blocks The data control approach characterized by making it manage at least using the data in which the head record location of said image voice block is shown, the data in which the magnitude of said image voice block is shown, and the file management data which have data in which Rink during said image voice block is shown.

[Claim 2] The data-control approach according to claim 1 characterized by making it manage using the frame management data which has the data in which 1 or two or more image voice frames constitute said image voice block, and the head record location of said image voice frame is shown for said image voice frame at least, the data in which the magnitude of said image voice frame is shown, and data in which said image voice inter-frame Rink is shown.

[Claim 3] Collect 1 or two or more sectors, constitute partition area, collect said continuous partition area further, and isometric record area is constituted. While managing using the record area management data which has the data in which Rink between empty isometric record area is shown for said isometric record area at least, and data in which Rink between operating isometric record area is shown The data control approach according to claim 1 or 2 which chooses long record area, such as recording said image voice file, and is characterized by recording said image voice block on long record area, such as having been chosen, in order in response to the record demand of an image voice file.

[Claim 4] The data control approach according to claim 3 characterized by arranging said management data field in the center of said record medium, and arranging 1 or said two or more isometric record area before and behind said management data field.

[Claim 5] The data control approach according to claim 3 or 4 characterized by determining the number of said isometric record area based on the storage

capacity of said record medium.

[Claim 6] claim 3 characterized by computing the storage capacity of an image voice file used as the candidate for record in response to the record demand of an image voice file, and securing isometric record area based on a calculation result thru/or claim 5 -- the data control approach given in either.

[Claim 7] It divides into the data in which Rink between long record area, such as constituting the data and the field which can be addressed which shows Rink between long record area, such as constituting an address keepout area for the data in which Rink between said operating isometric record area is shown, is shown. When the record demand of an image voice file is received, said image voice file used as the candidate for record judges an address prohibition file or the file which can be addressed. claim 3 characterized by making it record on long record area, such as constituting the field [constituting said address keepout area for said image voice file etc.] which can be addressed [long record area or / said] based on a judgment result, thru/or claim 6 -- the data control approach given in either.

[Claim 8] When isometric record area is not registered into the data in which Rink between said empty isometric record area is shown, The isometric record area where the oldest image voice file is recorded out of long record area, such as constituting the field which can be addressed, is chosen. The data control approach according to claim 7 characterized by adding long record area, such as having been chosen as the data in which Rink between long record area, such as constituting the data in which Rink between long record area, such as constituting said address keepout area, is shown, or said field which can be addressed, is shown.

[Claim 9] A coding means to generate the image voice data which is the coded signal which carried out band compression from the binary-ized signal which consists of both an image, voice, or an image and voice, The buffer which stores temporarily the image voice data generated with said coding means, The record medium which records said image voice block on said image voice data field when the magnitude of the image voice block which consisted of said image voice data exceeds a predetermined value, while having an image voice data field and a management data field, The data in

which the head record location of said image voice block is shown at least, the data in which the magnitude of said image voice block is shown, A file management means to manage a file using the data in which Rink during said image voice block is shown, and the file management data which have a file name, The data in which the head record location of 1 which constitutes said image voice block, or two or more image voice frames is shown, The frame management tool which manages a frame using the frame management data which has the data in which the magnitude of said image voice frame is shown, and data in which said image voice inter-frame Rink is shown, The recording device characterized by having the control means which carries out desired actuation to the whole equipment according to the processing demand from the outside, a record playback means to give record and playback timing of image voice data, and said record medium and a data-access means to control the data transfer between said record playback means.

[Claim 10] The data in which 1 or two or more sectors are collected, partition area is constituted, said continuous partition area is collected further, isometric record area is constituted, and Rink between empty isometric record area is shown for said isometric record area at least, It has the record area management tool managed using the record area management data which has data in which Rink between operating isometric record area is shown. The recording device according to claim 9 which chooses long record area, such as recording said image voice file, and is characterized by recording said image voice block on long record area, such as having been chosen, in order in response to the record demand of an image voice file.

[Claim 11] Said record medium is a recording device according to claim 10 characterized by arranging said management data field in the center of said record medium, and arranging 1 and said two or more isometric record area before and behind said management data field.

[Claim 12] Said record area management tool is a recording device according to claim 10 or 11 characterized by determining the number of said isometric record area based on the storage capacity of said record medium.

[Claim 13] claim 10 characterized by for said file management means

computing the storage capacity of an image voice file used as the candidate for record in response to the record demand of an image voice file, and securing isometric record area based on a calculation result thru/or claim 12 -- a recording device given in either.

[Claim 14] It divides into the data in which Rink between long record area, such as constituting the data and the field which can be addressed which shows Rink between long record area, such as constituting an address keepout area for the data in which Rink between said operating isometric record area is shown, is shown. When the record demand of an image voice file is received, said image voice file used as the candidate for record judges an address prohibition file or the file which can be addressed. claim 10 characterized by making it record on long record area, such as constituting the field [constituting said address keepout area for said image voice file etc.] which can be addressed [long record area or / said] based on a judgment result, thru/or claim 13 -- a recording device given in either.

[Claim 15] When isometric record area is not registered into the data in which Rink between said empty isometric record area is shown, The isometric record area where the oldest image voice file is recorded out of long record area, such as constituting the field which can be addressed, is chosen. The recording device according to claim 14 characterized by adding long record area, such as having been chosen as the data in which Rink between long record area, such as constituting the data in which Rink between long record area, such as constituting said address keepout area, is shown, or said field which can be addressed, is shown.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the recording apparatus which

records the image voice file which is represented by real-time stream data, such as image data and voice data, and which consists of mass digital data, and its data control approach.

[0002]

[Description of the Prior Art] In recent years, also in the monitor field, the demand to the recording device which records mass digital data represented by real-time stream data, such as image data and voice data, is increasing with progress of the large capacity-ized technique of disk media, such as a magnetic disk and an optical disk. In case there is a demand of wanting to save the data before and behind alarm signal detection time of day during the endless record which records monitor data without any restriction when the alarm signal which shows a certain abnormalities is detected and data are recorded on disk media for a monitor application, the data control approach how to record a file on disk media is important for how to the record section of a file to assign etc.

[0003] Conventionally, that the recording device was indicated to be by JP,8-339318,A is known. The configuration of the conventional recording apparatus 100 is shown, drawing 15 grasps the condition of fragmentation-izing of data by the file fragmentation detecting element 133 based on the number of file entries and the number of record entries in the management data of disk media 110, when it judges with data being divided too much, by the 1st block move section 134, moves data and lessens the number of fragmentation of the same file. Moreover, based on the number of free areas, and the number of record entries, the distributed condition of a free area has been grasped by the free-area fragmentation detecting element 135, and when it judged with a free area being distributed too much finely, it was constituted so that a data block might be moved and the continuous big free area might be secured by the 2nd block move section 136.

[0004] An example of migration processing of this data block is explained using drawing 16 . In drawing 16 , the file A which consists of a record block A1, and the file D which consists of record blocks D1, D2, and D3 are recorded on disk media. In such a condition, the number of partitions searches the greatest file first in the file currently recorded on disk media. In

the case of the example shown in (A) of drawing 16 , the file of max [number of partitions] is the file D by which data are divided into the block D3 from the block D1. And it is confirmed whether there is only any free area which makes order move the block from a top block to the back of a block [before and after] or a front about File D. As it confirms whether it is movable behind the previous block and it is specifically first shown in (B) of drawing 16 about each block, the tooth space of a free area 1 is larger than block D2, and when block D2 is movable, as an arrow head shows, it moves. As shown in (C) of drawing 16 , the data within block D1 and the data within block D2 will adjoin mutually, and will be arranged on disk media by this migration.

[0005]

[Problem(s) to be Solved by the Invention] However, in such a conventional recording device, when record over multiple files was performed to coincidence, the data block of each file was divided and it was recorded on disk media, and since migration of the data block for avoiding fragmentation-ization of data was performed, the chart lasting time of a file increased, and there was a fault that the engine performance as a recording device fell, for example. Moreover, when the endless record function which overwrites a record section repeatedly, and the alarm signal which shows a certain abnormalities during endless record are detected, in order skip the data block near [which was recorded on disk media at the time of endless record] an alarm input (henceforth, an address prohibition data block) in the recording apparatus which has the PURIARAMU record function save alarm signal-detection time-of-day order and to carry out overwrite record, a free area generates before and after the address prohibition data block. In the monitoring system into which an alarm signal is inputted frequently, a free area distributes to the whole disk media. In the above-mentioned data control method, since migration of the data block for securing the continuous big free area occurred when judged with the distributed condition of a free area not being suitable, the chart lasting time of a file increased and there was a fault that the engine performance as a recording device fell.

[0006] This invention aims at offering the outstanding recording apparatus and the outstanding data control approach of reducing seeking and the count of a

search of a head, in order to solve the above-mentioned problem.

[0007]

[Means for Solving the Problem] In the data control approach of managing the image voice data with which this invention consists of both an image, voice, or an image and voice to the record medium which has an image voice data field and a management data field An image voice block is constituted from said image voice data which stored said image voice data temporarily at the buffer, and was stored temporarily at said buffer. When the magnitude of said image voice block exceeds a predetermined value, while recording said image voice block on said image voice data field 1 belonging to an image voice file, or said two or more image voice blocks It has the configuration managed at least using the data in which the head record location of said image voice block is shown, the data in which the magnitude of said image voice block is shown, and the file management data which have data in which the link during said image voice block is shown. The data control approach that the count of seeking and the count of a search of a head can be reduced can be offered by recording image voice data on a record medium, and managing it per image voice block, by this configuration.

[0008] Moreover, this invention constitutes said image voice block by 1 or two or more image voice frames, and has the configuration managed using the frame management data which has the data in which the head record location of said image voice frame is shown for said image voice frame at least, the data in which the magnitude of said image voice frame is shown, and data in which a said image voice inter-frame link is shown in the data-control approach. While being able to lessen fragmentation and being able to reduce the count of seeking and the count of a search of a head by this configuration in the image voice data inputted into every frame (image voice frame), the data control approach that access to 1 or two or more image voice frames which have been arranged in an image voice block can be performed efficiently can be offered.

[0009] Moreover, in the data control approach, this invention collects 1 or two or more sectors, and constitutes partition area. Said continuous partition area is collected and isometric record area is constituted. Furthermore, said

isometric record area While managing using the record area management data which has at least the data in which the link between empty isometric record area is shown, and data in which the link between operating isometric record area is shown In response to the record demand of an image voice file, long record area, such as recording said image voice file, is chosen, and it has the configuration which recorded said image voice block on long record area, such as having been chosen, in order. While being able to lessen decentralization of a free area, without moving the block of the data currently recorded on the record medium by this configuration, the data control approach that it can ask for the free area in an image voice data field easily based on the operating condition in each isometric record area can be offered.

[0010] Moreover, this invention has the configuration which arranges said management data field in the center of said record medium, and arranged 1 or said two or more isometric record area before and behind said management data field in the data control approach. By this configuration, the data control approach which can shorten the transit time of a recording head in actuation of seeking etc. can be offered.

[0011] Moreover, this invention has the configuration which determined the number of said isometric record area in the data control approach based on the storage capacity of said record medium. By this configuration, isometric record area can be optimized and the data control approach which can record data efficiently can be offered.

[0012] Moreover, in the data control approach, this invention computes the storage capacity of an image voice file used as the candidate for record in response to the record demand of an image voice file, and has the configuration which secured isometric record area based on the calculation result. By this configuration, by securing isometric record area before data-logging initiation, the image voice file used as the candidate for an address can be set as prohibition of playback, and the data control approach that address processing can be performed easily can be offered.

[0013] This invention moreover, the data in which the link between said operating isometric record area is shown in the data control approach It divides into the data in which the link between long record area, such as

constituting the data and the field which can be addressed which shows the link between long record area, such as constituting an address keepout area, is shown. When the record demand of an image voice file is received, said image voice file used as the candidate for record judges an address prohibition file or the file which can be addressed. It has the configuration recorded on long record area, such as constituting the field [constituting said address keepout area for said image voice file etc.] which can be addressed [long record area or / said] based on a judgment result. The data control approach which can extend each record section flexibly according to a record situation can be offered by classifying and managing an address keepout area and the field which can be addressed per isometric record area by this configuration.

[0014] Moreover, when isometric record area is not registered into the data which this invention shows the link between said empty isometric record area in the data control approach, The isometric record area where the oldest image voice file is recorded out of long record area, such as constituting the field which can be addressed, is chosen. It has the configuration which added long record area, such as having been chosen as the data in which the link between long record area, such as constituting the data in which the link between long record area, such as constituting said address keepout area, is shown, or said field which can be addressed, is shown. By this configuration, the data control approach that isometric record area can be flexibly distributed to each record section according to a record situation can be offered.

[0015] Moreover, a coding means to generate the image voice data which is the coded signal which carried out the band compression of this invention in the recording device from the binary-ized signal which consists of both an image, voice, or an image and voice, The buffer which stores temporarily the image voice data generated with said coding means, The record medium which records said image voice block on said image voice data field when the magnitude of the image voice block which consisted of said image voice data exceeds a predetermined value, while having an image voice data field and a management data field, The data in which the head record location of said image voice block is shown at least, the data in which the magnitude of said

image voice block is shown, A file management means to manage a file using the data in which the link during said image voice block is shown, and the file management data which have a file name, The data in which the head record location of 1 which constitutes said image voice block, or two or more image voice frames is shown, The frame management tool which manages a frame using the frame management data which has the data in which the magnitude of said image voice frame is shown, and data in which a said image voice inter-frame link is shown, It has the configuration equipped with the control means which carries out desired actuation to the whole equipment according to the processing demand from the outside, a record playback means to give record and playback timing of image voice data, and said record medium and a data-access means to control the data transfer between said record playback means. The recording device which can reduce the count of seeking and the count of a search of a head can be offered by recording image voice data on a record medium, and managing it per image voice block, by this configuration.

[0016] Moreover, in a recording device, this invention collects 1 or two or more sectors, and constitutes partition area. Furthermore, the data in which said continuous partition area is collected, isometric record area is constituted, and the link between empty isometric record area is shown for said isometric record area at least, It has the record area management tool managed using the record area management data which has data in which the link between operating isometric record area is shown. In response to the record demand of an image voice file, long record area, such as recording said image voice file, is chosen, and it has the configuration which recorded said image voice block on long record area, such as having been chosen, in order. While being able to lessen decentralization of a free area, without moving the block of the data currently recorded on the record medium by this configuration, the recording device which can ask for the free area in an image voice data field easily based on the operating condition in each isometric record area can be offered.

[0017] Moreover, this invention has the configuration which said record medium arranges said management data field in the center of said record

medium, and arranged 1 and said two or more isometric record area before and behind said management data field in the recording apparatus. By this configuration, the recording device which can shorten the transit time of a recording head in actuation of seeking etc. can be offered.

[0018] Moreover, this invention has the configuration as which said record area management tool determined the number of said isometric record area based on the storage capacity of said record medium in the recording device. By this configuration, isometric record area can be optimized and the recording device which can record data efficiently can be offered.

[0019] Moreover, in the recording device, said file management means computes the storage capacity of an image voice file used as the candidate for record in response to the record demand of an image voice file, and this invention has the configuration which secured isometric record area based on the calculation result. By this configuration, by securing isometric record area before data-logging initiation, the image voice file used as the candidate for an address can be set as prohibition of playback, and the recording device which can perform address processing easily can be offered.

[0020] This invention moreover, the data in which the link between said operating isometric record area is shown in a recording apparatus It divides into the data in which the link between long record area, such as constituting the data and the field which can be addressed which shows the link between long record area, such as constituting an address keepout area, is shown. When the record demand of an image voice file is received, said image voice file used as the candidate for record judges an address prohibition file or the file which can be addressed. It has the configuration recorded on long record area, such as constituting the field [constituting said address keepout area for said image voice file etc.] which can be addressed [long record area or / said] based on a judgment result. The recording device which can extend each record section flexibly according to a record situation can be offered by classifying and managing an address keepout area and the field which can be addressed per isometric record area by this configuration.

[0021] Moreover, when isometric record area is not registered into the data which this invention shows the link between said empty isometric record area

in a recording apparatus, The isometric record area where the oldest image voice file is recorded out of long record area, such as constituting the field which can be addressed, is chosen. It has the configuration which added long record area, such as having been chosen as the data in which the link between long record area, such as constituting the data in which the link between long record area, such as constituting said address keepout area, is shown, or said field which can be addressed, is shown. By this configuration, the recording device which can distribute isometric record area to each record section flexibly according to a record situation can be offered.

[0022]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained using a drawing. When the gestalt of this operation detects the endless record function which repeats and overwrites for example, image voice data, and the alarm signal which shows a certain abnormalities, it is a recording device suitable for the monitoring system which has the PURIARAMU record function to save the data before and behind alarm signal detection time of day.

[0023] Drawing 1 is the block diagram showing 1 operation gestalt of the recording apparatus concerning this invention. A recording apparatus 10 has disk media (record medium) 20, the data-access means 31, the coding means 32, a buffer 33, a control means 34, the record playback means 35, and the image voice data management tool 36. Moreover, the image voice data management tool 36 has the file management means 52, the frame management tool 53, and the record area management tool 54. Moreover, disk media 20 consist of an image voice data field 21 and a management data field 22.

[0024] The configuration of each part of the recording device 10 shown in drawing 1 is explained.

[0025] First, the disk media 20 of drawing 1 are explained. Disk media 20 are hard disks which actually record image voice data and administrative data. By arranging the management data field 22 in the center of a disk, the seeking distance of disk media 20 of the head at the time of data logging and data playback decreases, and an effective transfer rate goes up them. Each

storage region is divided into every predetermined cutting tool's (this operation gestalt 512 bytes) sector, and data are recorded by making this sector into a unit. The image voice data field 21 consists of two or more isometric record area which makes a unit the partition sector (partition area) (this operation gestalt 100 sectors) which collected 1 or two or more sectors (this operation gestalt 6 isometric record area). Moreover, it is not recorded on the isometric record area where the image voice block of the ban on an address and the image voice block which can be addressed are the same. That is, the image voice data field 21 is divided into the address keepout area which consists of 1 or two or more isometric record area which record the image voice block of the ban on an address, and the field which consists of 1 or two or more isometric record area which record the image voice block which can be addressed and which can be addressed.

[0026] The management method of management data and image voice data is explained using drawing 2 - drawing 8 . Drawing 2 is drawing showing the management data in 1 operation gestalt of the recording apparatus concerning this invention, and the file entry 23, the block entry 24, the frame entry 25, the record area data 26, and the record area entry 27 of drawing 2 are prepared in the management data field 22 of the disk media 20 of drawing 1 . In addition, a file entry 23 and the block entry 24 constitute the file management data which manage a file, the frame entry 25 constitutes the frame management data which manages a frame, and the record area data 26 and the record area entry 27 constitute the record area management data which manages isometric record area.

[0027] Every one file entry 23 exists to each image voice file, and the file name of the image voice file and the link data to a head block entry are recorded. Said link data are the number of a block entry. In addition, 1 image voice file collects 1 or two or more image voice blocks, and is constituted. Moreover, 1 image voice block collects 1 or two or more image voice frames, and is constituted. Here, an image voice frame is the assembly of continuous data, and it has the predetermined data length. For example, they are predetermined data, such as a part for a part for one coma of one image of a static image, and an animation, and audio predetermined time.

[0028] The link data which the block entry 24 shows the link relation to a block [degree] entry, the head location data in which the head location of the block field where image voice data is actually recorded is shown, the record length data in which the size of a block field is shown, and the link data to a head frame entry are recorded. This block entry 24 exists for every image voice block, when 1 image voice file is divided and recorded on two or more image voice blocks. Said link data are the number of a block entry, and the EOR (end of record) code is recorded in the block entry corresponding to the last image voice block. As head location data and record length data, the sector number and the number of sectors of real storage are recorded. In addition, the isometric record area where an image voice block is recorded makes the partition sector the unit, and the integral multiple of a partition sector is recorded as record length data. Since partition sectors are specifically 100 sectors when the sizes of an actual block field are 165 sectors, the record length data recorded on a corresponding block entry are 200.

[0029] Every one frame entry 25 exists to each image voice frame, and the link data in which the link relation to a frame [degree] entry is shown, the head location data in which the head record location of an image voice frame is shown, and the record length data in which the size of an image voice frame is shown are recorded. Said link data are the number of a frame entry, and the EOF (End of Frame) code is recorded in the frame entry corresponding to the last image voice frame. In addition, as head location data, the sector number which makes the head location of an image voice block field criteria (sector number 0) is recorded.

[0030] The address prohibition link data in which the link relation between long record area, such as the record area data 26 existing in one disk media 20, and constituting an address keepout area, is shown, The link data in which the link relation between long record area, such as constituting the field which can be addressed, is shown and which can be addressed, Long record area length (this operation gestalt 1000 sectors) -- the free-area link data in which the link relation between long record area, such as constituting a free area, is shown, the number of isometric record area (this operation gestalt 6), and the size of isometric record area are shown -- is recorded. Said link data

are the number of a record area entry. Moreover, the number of sectors of real storage is recorded as isometric record area length.

[0031] Every one record area entry 27 exists to each isometric record area, and the link data in which the link relation to a record [degree] area entry is shown, and the record location data in which the head location of a free space in isometric record area is shown are recorded. It is the number of a record area entry as said link data, and the EOL (end of list) code is recorded in the record area entry corresponding to an address keepout area, the field which can be addressed, and the last isometric record area of a free area. The sector number of real storage is recorded as record location data. In addition, a free space is a field where the image voice block is not recorded, and an image voice block is packed and recorded from the head of a free space.

[0032] Such management data is explained still more concretely using drawing 3 - drawing 8 .

[0033] Drawing 3 is drawing showing arrangement of the management data field in 1 operation gestalt of the recording apparatus concerning this invention, and an image voice data field. The image voice data field 21 of drawing 1 consists of isometric record area of a0, a1, a2, a3, a4, and a5, as shown in drawing 3 . In a sector number 999 and a1, the sector number 1999 from a sector number 1000 and a2 the sector number 5999 from a sector number 5000, and a4 for the sector number 2999 from a sector number 2000, and a3 from a sector number 0 From a sector number 6000 to a sector number 6999 [a0] a5 is real storage where a sector number 7000 to the sector number 7999 continues. Here, a0 and a2 are address keepout areas, and a1, a3, and a4 are the fields which can be addressed. A free area is only a5.

[0034] Drawing 4 shows the record situation of each isometric record area a0-a5 which is drawing and was shown in drawing 3 which shows the example of the record situation of long record area -- it can set in 1 operation gestalt of the recording device concerning this invention. Three image voice block is continued and recorded on a0 by the sector number 799 from the sector number 0, and 200 sectors after a sector number 800 are free space. Four

image voice block is continued and recorded on the sector number 1999 from the sector number 1000 by a1, and there is no free space in it. Two image voice block is continued and recorded on a2 by the sector number 2599 from the sector number 2000, and 400 sectors after a sector number 2600 are free space. Three image voice block is continued and recorded on a3 by the sector number 5899 from the sector number 5000, and 100 sectors after a sector number 5900 are free space. Two image voice block is continued and recorded on a4 by the sector number 6599 from the sector number 6000, and 400 sectors after a sector number 6600 are free space. Since a5 is empty isometric record area, 1000 sectors after a sector number 7000 are free space. A free space is a field where the image voice block is not recorded, and an image voice block is packed and recorded from the head of a free space. When the size of the image voice block used as the candidate for record exceeds the size of a free space, new isometric record area is secured and sequential record is carried out from the head of the isometric record area.

[0035] Drawing 5 is drawing showing the example of the state of control of long record area -- it can set in 1 operation gestalt of the recording device concerning this invention -- and shows the record area data and the record area entry corresponding to a record situation of drawing 4 . In record area entry #0, record area entry #1 the record situation in the isometric record area a0 the record situation in the isometric record area a1 In record area entry #2, record area entry #3 the record situation in the isometric record area a2 the record situation in the isometric record area a3 Record area entry #4 express the record situation in the isometric record area a4, and record area entry #5 express the record situation in the isometric record area a5, respectively. The head sector number of the free space of long record area, such as corresponding, is recorded on the record location data of each record area entry.

[0036] Drawing 6 is drawing showing the example of arrangement of the image voice file in 1 operation gestalt of the recording device concerning this invention. Drawing 7 is drawing showing the example of arrangement of the image voice frame in 1 operation gestalt of the recording device concerning this invention. Drawing 8 is drawing showing the example of the state of

control of the image voice file in 1 operation gestalt of the recording device concerning this invention, and an image voice frame.

[0037] In drawing 6 , File A consists of image voice blocks A1 and A2, and File B consists of image voice blocks B1. Moreover, the head location data and record length data of the image voice block A1 are a sector number 5000 and 200 sectors, the head location data and record length data of the image voice block B1 are a sector number 5200 and 400 sectors, and the head location data and record length data of the image voice block A2 are a sector number 5600 and 300 sectors.

[0038] In drawing 7 , the image voice frames A11, A12, and A13 constitute the image voice block A1 of drawing 6 . Moreover, the head locations and record length data of the image voice frame A11 are 0 and 60 sectors, the head location data and record length data of the image voice frame A12 are 60 and 60 sectors, and the head location data and record length data of the image voice frame A13 are 120 and 40 sectors. In addition, 40 sectors after a sector number 5160 serve as an amends field where the invalid data is recorded.

[0039] In drawing 8 , file entry #20, block entry #100, and block entry #102 express the image voice file A of drawing 6 (image voice blocks A1 and A2), and file entry #21 and block entry #101 express the image voice file B of drawing 6 (image voice block B1). Moreover, frame entry #50, #51, and #52 express the image voice frames A11, A12, and A13 of drawing 7 .

[0040] Next, the data-access means 31 of drawing 1 is explained. The data-access means 31 actually drives and controls disk media 20, and performs writing and read-out of data. Specifically, the record and playback of data to rotation of disk media 20, seeking of a head, the search of a sector, and a desired storage region are performed.

[0041] Next, the coding means 32 of drawing 1 is explained. The coding means 32 generates the image voice data which is the coded signal which carried out band compression from the binary-ized signal which consists of both an image, voice, or an image and voice on every frame (image voice frame), and stores it temporarily at a buffer 33.

[0042] Next, the buffer 33 of drawing 1 is explained. A buffer 33 stores temporarily the image voice data which the coding means 32 generated. In

this buffer 33, 1 or two or more image voice frames are collected, and an image voice block is constituted. Specifically, the buffer 33 is formed in memory.

[0043] Next, the control means 34 of drawing 1 is explained. A control means 34 controls each part which constitutes a recording device 10 in order to carry out desired actuation to the recording device 10 whole. A control means 34 receives the record signal and regenerative signal from a device of a high order to the pan connected to the recording device 10, and directs each processing for the record playback means 35 based on this signal. Moreover, when a record signal is received, a control means 34 transmits the attribute information on an image voice file used as the candidate for record to the file management means 52 of the image voice data management tool 36, and requires new file creation. There are data in which it is shown whether it is the ban on whether the image voice file used as the candidate for record can be addressed as attribute information and an address, and data in which the storage capacity of an image voice file is shown.

[0044] Next, the record playback means 35 of drawing 1 is explained. The record playback means 35 actually controls the flow of the image voice data recorded on disk media 20, and the image voice data read from disk media 20. At the time of data logging, the management data currently recorded on the management data field 22 of disk media 20 through the data-access means 31 is read first. Next, the size D of the image voice block stored temporarily at the buffer 33 is computed. Furthermore, the D is judged as record of the image voice block to disk media 20 being appropriate, when it is $D > D_{THL}$ beforehand as compared with a threshold D_{THL} . In addition, in the gestalt of this operation, a threshold D_{THL} is 100. Therefore, when the size of an image voice block exceeds 100 sectors, it judges with record of the image voice block to disk media 20 being appropriate.

[0045] As a result of said judgment, when record of the image voice block to disk media 20 is appropriate, the sector which records image voice data in the image voice data field 21 of disk media 20 is determined, and record into the sector is actually performed through the data-access means 31. And after the image voice data management tool 36 adds the information about the newly

recorded data to said management data and updates it, it records on the management data field 22 through the data-access means 31. Here, when reproducing recording, while the image voice data generated by the coding means 32 is accumulated in the buffer 33, by giving priority to playback and performing it, the record playback means 35 reduces seeking of a recording head, and the count of a search, and raises an effective transfer rate.

[0046] Said management data is first read like the time of data logging at the time of data playback. And based on the management data, the data currently recorded on each sector in the image voice data field 21 of disk media 20 are read, and it outputs outside to predetermined timing. At the time of data read-out, the renewal of said management data is unnecessary.

[0047] Next, each part of the image voice data management tool 36 of drawing 1 is explained.

[0048] As opposed to the file entry (23 of drawing 2) corresponding to an image voice file in the file management means 52 Whenever an image voice block is recorded on the image voice data field 21, the information (head location data and record length data) about an image voice block is recorded on a block entry (24 of drawing 2). The link data linked to said file entry 23 are reconstructed so that the image voice block corresponding to the block entry may turn into the last image voice block. In case it reproduces recording image voice data, even the image voice data currently recorded on the last image voice block serves as a candidate for playback. Moreover, when the new file-creation demand from a control means 34 is received, while the image voice file used as the candidate for record judges the file which can be addressed, or an address prohibition file based on the attribute information included in a file-creation demand, a file-management means 52 computes the storage capacity of said image voice file, and outputs the signal of the purport require the reservation of the storage region for recording said image voice file to a record area management tool 54.

[0049] The frame management tool 53 builds the link of each frame entry so that it may stand in a line in order of record, while recording the information (head location data and record length data) about an image voice frame on a frame entry (25 of drawing 2) like the file management means 52, whenever

an image voice block is recorded on the image voice data field 21. And the frame entry number of a head frame entry is recorded on the link data of the head frame entry of an applicable block entry.

[0050] Whenever the record area management tool 54 receives the signal of the purport which requires reservation of the storage region from the file management means 52, it secures the storage region for recording an image voice file based on the attribute information included in said signal (reserved storage is henceforth called a reservation field). In addition, the reservation field is managed using record area data (26 of drawing 2), the record area entry (27 of drawing 2), and the reserved sector number, and secures the reservation field sequentially from the head of a free space in isometric record area. The last sector number of the reservation field in the last isometric record area where a reserved sector number constitutes an address keepout area and the field which can be addressed is recorded. By a2 which is the last isometric record area of an address keepout area, as shown in drawing 9 , specifically, the storage region for 200 sectors which make a sector number 2600 a head is secured as a reservation field. 2799 is recorded on the reserved sector number at this time. When reservation of a reservation field is required from the file management means 52 next time, the reservation field which makes a sector number 2800 a head is newly secured. Moreover, the record area management tool 54 determines the head location of the field for recording an image voice block at the time of image voice block record.

[0051] Next, it explains that the management method of the reservation field in the record area management tool 54 flows using drawing 1 , drawing 10 - drawing 13 . Drawing showing the disk media (record medium) of the example of reservation partitioning in 1 operation gestalt of the recording apparatus which drawing 10 requires for this invention, drawing in which drawing 11 shows the record situation of the isometric record area, and drawing 12 are drawings showing the state of control. The image voice data field 21 of disk media 20 is classified into the address keepout area which is shown in drawing 10 and which consists of isometric record area a0, a2, and a5 like, and the field which consists of isometric record area a1, a3, and a4 and which can be addressed. In addition, empty isometric record area does not exist in

the image voice data field 21. Drawing 13 is a flow chart which shows the extended processing in 1 operation gestalt of the recording apparatus concerning this invention, and shows extended processing of an address keepout area and the field which can be addressed.

[0052] First, if a control means 34 receives the record signal from the device connected to the recording device 10, it will require creation of the new file F from the file management means 52. The file management means 52 creates the file entry corresponding to the image voice file F used as the candidate for record based on the new file creation demand from a control means 34, and computes the storage capacity SF of said image voice file F. Moreover, the attribute information containing the data in which it is shown whether it is the ban on whether the file management means 52 can address the storage capacity SF of said image voice file F (this operation gestalt 200 sectors) and said image voice file F and an address is transmitted to the record area management tool 54, and reservation of the storage region for recording the image voice file F is required (S10). The record area management tool 54 judges whether the ban on an address or an address of the new image voice file F is possible based on the attribute information from the file management means 52 (S11). When the image voice file F is an address prohibition file as a result of said judgment, non-reserved area-size S in the last isometric record area a5 of an address keepout area is computed (S12, S14). Moreover, when the image voice file F is a file which can be addressed, non-reserved area-size S in the last isometric record area a4 of the field which can be addressed is computed (S13, S14). it is shown in drawing 11 -- like -- etc. -- the non-reserved area size in the long record area a5 is 200 sectors, and the non-reserved area size in the isometric record area a4 is 200 sectors. And the storage capacity SF of the image voice file F is compared with non-reserved area-size S (S15), when it is $S < SF$, extended processing of an address keepout area or the field which can be addressed is performed, and the reservation field for a sector is newly secured from the head of long record area, such as having been extended, (SF-S). When said comparison result is $S \geq SF$, the reserved sector number set as an address keepout area or the last isometric record area in [which can be addressed] a field is updated.

When the image voice file F is an address prohibition file, specifically, the reserved sector number of the isometric record area a5 is updated to 7999 which added SF to 7799. Moreover, when the image voice file F is a file which can be addressed, the reserved sector number of the isometric record area a4 is updated to 6999 which added SF to 6799. Here, the newly secured reservation field does not necessarily record the image voice file F. The image voice block is recorded in order from the head of a reservation field.

[0053] Henceforth, after explaining the extended approach of an address keepout area, the extended approach of the field which can be addressed is explained.

[0054] The extended approach of an address keepout area is explained. First, with reference to the free-area link data of record area data, it judges whether empty isometric record area exists (S17). Since empty isometric record area does not exist in an image voice data field as shown in drawing 10 , it progresses to S18. Here, when empty isometric record area exists, an address keepout area is extended by linking the record area entry corresponding to the empty isometric record area to the address prohibition link data of record area data (S20). The record area data and the record entry at the time of adding the empty isometric record area a5 shown in drawing 3 to an address keepout area are shown in (A) of drawing 14 . When empty isometric record area does not exist in an image voice data field as a result of said judgment, the 1 isometric record area in long record area, such as constituting the field which can be addressed, is added to an address keepout area. That is, the flexible storage management according to a record situation is realized by deleting the field in an image voice data field which can be addressed, and adding the deleted storage region to an address keepout area. Specifically, it checks first whether the field which can be addressed exists in an image voice data field (S18). next, when judged with the field which can be addressed existing in an image voice data field Isometric record area a1 (henceforth) where the oldest image voice file in [which can be addressed] a field is recorded An address keepout area is extended by choosing the oldest isometric record area (S19), and linking record area entry #1 corresponding to said long record area a1, such as having been chosen, to the address

prohibition link data of record area data (S21, S22). The record area data and the record area entry at this time are shown in (B) of drawing 14 . Here, in (B) of drawing 14 , although the isometric record area a1 whole is set as a free space, about the image voice file which is not addressed, it is refreshable.

[0055] Next, the extended approach of the field which can be addressed is explained. First, with reference to the free-area link data of record area data, it checks whether empty isometric record area exists like the extended approach of an address keepout area (S17). Since empty isometric record area does not exist in an image voice data field as shown in drawing 10 , it progresses to S18. Here, when empty isometric record area exists, the field which can be addressed is extended by linking the record area entry corresponding to the empty isometric record area to the link data of record area data which can be addressed (S20). When empty isometric record area does not exist in the image voice data field 21 as a result of said judgment, as shown in (C) of drawing 14 , the oldest isometric record area is deleted from the link data which can be addressed, and the isometric record area is newly added to the field which can be addressed (S18, S19, S21, S22). That is, in the field which can be addressed, 1 or two or more isometric record area which constitute the field which can be addressed are managed with ring buffer structure. Thus, according to the recording device of this operation gestalt, by establishing isometric record area in a record medium, it prevents distributing very finely, and a free area is appropriately efficient and can record an image voice file.

[0056] Moreover, although considered as the hard disk, if the record medium of the recording apparatus of this operation gestalt is a record medium in which not only this but random access is possible, it is good at the record medium of arbitration. For example, a magneto-optic disk and a rewritable optical disk are sufficient.

[0057]

[Effect of the Invention] Since this invention is recorded on a record medium when an image voice block is constituted from image voice data which transmitted the generated image voice data to the buffer, and was transmitted to the buffer and the size of this image voice block exceeds a threshold so

that clearly also from the gestalt of the above-mentioned implementation, seeking and the count of a search of a head can be reduced.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The block diagram showing 1 operation gestalt of the recording apparatus concerning this invention

[Drawing 2] Drawing showing the management data in 1 operation gestalt of the recording apparatus concerning this invention

[Drawing 3] Drawing showing the example of arrangement of the management data field in 1 operation gestalt of the recording apparatus concerning this invention, and an image voice data field

[Drawing 4] Drawing showing the example of the record situation of long record area -- it can set in 1 operation gestalt of the recording device concerning this invention --

[Drawing 5] Drawing showing the example of the state of control of long record area -- it can set in 1 operation gestalt of the recording device concerning this invention --

[Drawing 6] Drawing showing the example of arrangement of the image voice file in 1 operation gestalt of the recording device concerning this invention

[Drawing 7] Drawing showing the example of arrangement of the image voice frame in 1 operation gestalt of the recording device concerning this invention

[Drawing 8] Drawing showing the example of the state of control of the image voice file in 1 operation gestalt of the recording device concerning this invention, and an image voice frame

[Drawing 9] Drawing showing the example of reservation partitioning in 1 operation gestalt of the recording device concerning this invention

[Drawing 10] Drawing showing the record medium of the example of reservation partitioning in 1 operation gestalt of the recording device

concerning this invention

[Drawing 11] Drawing showing the record situation of the isometric record area of the example of reservation partitioning in 1 operation gestalt of the recording device concerning this invention

[Drawing 12] Drawing showing the state of control of the example of reservation partitioning in 1 operation gestalt of the recording device concerning this invention

[Drawing 13] The flow chart which shows the extended processing in 1 operation gestalt of the recording apparatus concerning this invention

[Drawing 14] Drawing showing the example of the state of control of the address keepout area in 1 operation gestalt of the recording device concerning this invention, and the field which can be addressed

[Drawing 15] The block diagram showing the conventional recording apparatus

[Drawing 16] Drawing showing the example of migration of the data block in the conventional recording apparatus

[Description of Notations]

10 Recording Device

20 Disk Media (Record Medium)

21 Image Voice Data Field

22 Management Data Field

23 File Entry (File Management Data)

24 Block Entry (File Management Data)

25 Frame Entry (Frame Management Data)

26 Record Area Data (Record Area Management Data)

27 Record Area Entry (Record Area Management Data)

31 Data-Access Means

32 Coding Means

33 Buffer

34 Control Means

35 Record Playback Means

36 Image Voice Data Management Tool

52 File Management Means

53 Frame Management Tool

54 Record Area Management Tool

a0-a5 Isometric record area

A1, A2 Image voice block of File A

B1 Image voice block of File B

A11, A12, A13 Image voice frame of the image voice block A1
